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RESEARCH ARTICLE

One man's meat is another man's poison: Assessing the role of variations in project managers' leadership and structures on the relationship between neoliberal governmentality and project performance

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Abstract
Variations among human aspects of governance and management, and the structure of project-based organizations (PBO) may synergize or contrast with each other, eventually impacting project performance (PP). To investigate these variations, the study develops a conceptual model using neoliberal governmentality (NG), transformational (TFL), and transactional leadership styles (TSL) of project managers, centralization of governance structures (CEN) with PP. The data for the study was collected from PBOs in the construction sector. Partial Least Squares-Structural Equation Modeling (PLS-SEM) was applied to assess the results. Later, the conceptual model was validated using an Artificial Neural Network (ANN) Approach. The results revealed that TFL positively mediates the relationship between NG and PP in PBOs characterized by decentralized governance structures (Low CEN). TSL shows competitive partial mediation with NG and hence appears to be the least important predictor of PP in the studied context. Using contingency theory, the study extends the Sociological Perspective of Governance (SPG) to develop a cohesive model for understanding the variations of humans and structures for PP. Project owners, governors, and practitioners should hire synergetic project managers and provide them with training and communication opportunities during project. NG requires decentralized decision-making to empower a TFL for better PP.

Keywords
neoliberal governmentality; project manager leadership; transactional versus transformational styles; project performance; centralization of governance structure; sociological perspective of governance.

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1. Introduction

Projects drive organizational value (Ika & Pinto, 2022; Thomas, 2026) and effective project governance ensures their alignment with organizational strategic objectives and realization of intended benefits (Ul Musawir et al., 2020). However, project governance is still a budding phenomenon due to its varying role such as external versus internal (Ahola et al., 2014), multilevel of operations such as organizational, portfolio, and project level (Derakhshan et al., 2019), and its multifacetedness such as humanistic or structural aspects (Simard et al., 2018). More recent studies address these issues; for example, the sociological perspective of governance (SPG) positions human and structural agency together by elucidating project governance external to a specific project and operating at a higher level than the management (Müller, 2022). SPG describes project governance as an aggregation of governmentality and governance structures. From this perspective, governmentality is a human agency to its structural counterpart governance at the steering level, whereas leadership and management are their corresponding agencies at the project execution level. Governance in rational terms means structures for organizing in societies, such as firms or projects, while governmentality is how those in governance roles (i.e., governors) interact with those they govern. Management is a task-oriented activity for achieving planned results and is structural means for execution of getting things done by others while Leadership is a people-oriented activity (Müller, 2022; Müller et al., 2023).

Apart from a conceptual perspective, which attempts to clarify several uncertainties in project governance literature, SPG provides an opportunity to holistically study the variations of human aspects and structural arrangements of governance that impact project outcomes (Malik et al., 2025a; 2025b). Isolated studies on governmentality (Clegg et al., 2002; Müller et al., 2017), governance structure (Joslin & Müller, 2016; Narayanan & Narasimhan, 2014), and project managers' leadership styles (Müller & Turner, 2006; Nixon et al., 2012) are associated with project outcomes, like project success or project performance (PP). PP refers to behavioral results of an organization's expectation of a project (Zhu et al., 2021). Nevertheless, conception of variations in the forms of governmentality with the project level affecting PP has received meagre attention, especially when its forms such as authoritative, liberal and neoliberal are widely recognized (Clegg & Ninan, 2023; Dean, 2010; Müller, 2022). Prior studies observe governmentality, governors' style to the governed, to let project managers' leadership flourish in decision-making, eventually influencing PP (Turner, 2020a), who act as a buffer for translating the governmentality at the project level, while their styles may contrast or synergize with employed governmentality influencing the governance effectiveness (Malik et al., 2024). Recent studies also endorse use of governmentality as a conceptual tool to understand human-related issues like leadership styles, personalities, culture, politics, and tribalism in PBOs (Ul Musawir et al., 2024). However, despite the historic understanding of differences in human's perception of work (McGregor, 1960) and locus of control (Rotter, 1954), variations between neoliberal governmentality and project manager leadership style influencing PP remain unaddressed. To explore this generalized theoretical gap, this research selected construction sector of Pakistan as an empirical context to explore and validate proposed relationships.

The construction industry is selected due to several evidences of governance-related factors impacting PP, such as conflicts among participant (Li et al., 2018; Sinesilassie et al., 2017; Wu et al., 2019), leadership skills (Rehan et al.,2025; Enshassi et al., 2012), and project failure in developing countries due to governance issues (Damoah et al., 2018). This study focusses a specific form of governmentality, i.e., neoliberal governmentality (NG). NG differentiates itself from authoritative and liberal forms by having indirect interactions between the governors and the governed (Müller et al., 2017), and it is implemented by creating values and ideologies that develop the self-control of members (Franck & Jungwirth, 2003). There exists a positive relationship between NG and PP (Müller, 2022). However, a mismatch between governmentality and project manager leadership styles leads to information asymmetries and manipulation (Malik et al., 2024), raising agency cost which reduce PP (Eisenhardt, 1989; Jensen & Meckling, 1976). PP was specified as outcome variable for this study rather than project success, which has a broader scope (Atli & Krystallis, 2025; Ika & Pinto, 2022).

Based on the theoretical foundation outlined, the study poses its first research question below.

RQ1: Do varying project managers' leadership styles influence the relationship between NG and PP?

Additionally, recent research suggests that governance's human and structural aspects must be studied together (Müller et al., 2016; Simard et al., 2018). Existing literature elucidates the effectiveness of optimal internal arrangements of projects (Aubry & Lavoie-Tremblay, 2018) and the joint impact of governmentality-governance structures on project success (Müller et al., 2017). In projects, the reflexive processes between humans and structures contribute to organizational choices and decisions (Bakker et al., 2016). Organizational Project Management (OPM) discourse observes project managers as responsible and accountable actors, who exist at close proximity to the project governance (Drouin et al., 2017; Müller et al., 2019; Müller et al., 2023). Thus, project managers are influenced not only by the governmentality but also by the governance structures in place. So, to understand variations in structural aspects of governance alongside human aspects effecting PP, the study selects Centralization of governance structure (CEN) and proposes the following research question.

RQ2: Do variations in CEN influence the relationship between NG and differentiated project leadership styles for PP?

Collectively, RQ1 and RQ2 answer the main research question, i.e., *do varying project managers' leadership styles and CEN in PBOs influence the relationship of NG impacting PP?* The main research question accounts for the intertwined nature of structure and human in PBOs (Archer, 2010; Müller, 2022; Turner, 2020a). This study utilizes contingency theory, due to its prevalent use in project studies to understand optimal design arrangements of PBOs (Ul Musawir et al., 2020). The study used convenient sampling to collect data from 218 PBOs performing construction projects in Pakistan. The questionnaire for data collection included measurement scales that had already been used and tested in the project and management literature. The article uses Partial Least Squares-Structural Equation Modeling (PLS-SEM) and PLS-process for assessing the measurement model, structural model, and testing hypotheses (Hair et al., 2023). Furthermore, the study uses Analytical Neural Networks (ANN) for factor ranking, model validation, and sensitivity analysis (Al-Sharafi et al., 2023; Liébana-Cabanillas et al., 2017). This study adopts critical realism as an ontological and epistemological stance, acknowledging that results may not be generalizable universally, but are context-specific and grounded in the observed dataset (Bhaskar, 2010). Theoretically, the study contributes to present a novel conceptual model to understand the mediating role of TSL and TFL, and moderating role of CEN in the relationship between NG and PP, by extending SPG (Müller, 2022). Furthermore, the study acknowledges the superiority of human's self-reflexitivity over structures (Archer, 2010; Turner, 2020a, 2020b) by utilizing NG as an antecedent variable. Practically, the study explains governors of PBOs employing NG to use lower levels of CEN and empower project manager with TFL for higher PP.

The article is structured into four further standard sections: literature review, hypotheses development and research model, methodology, data analysis and results, and discussion and conclusions.

2. Literature review, hypotheses development, and research model

This section reviews prior studies relating to NG, PP, project leadership, and CEN. This literature informs the formulation of hypotheses in response to the research questions and subsequently aids in developing the study's research model.

2.1. Neoliberal governmentality

Clegg and colleagues studied construction megaprojects where networks joined through contractual ties and established cultural norms to develop an alliance culture to foster values for members to respond (Clegg et al., 2002), i.e., NG (Dean, 2010). Later, governmentality was proposed to manage projects through dialogues, cultures, and optimistic news (Clegg & Ninan, 2023) and to manage external stakeholders using social media to create positive community engagement towards the project (Ninan et al., 2019). Another influential perspective of understanding governmentality is the SPG

(Müller, 2022; Müller et al., 2023). SPG is theoretically grounded in Archer's Realist Social Theory (ARST), which underscores human self-reflexivity while explaining the inseparable concepts of human and structure (Archer, 2010). Prior studies acknowledge three distinct ways, rationalities, and mentalities of governors, i.e., authoritative, liberal, and neoliberal (Dean, 2010). Several studies have also shown the impact of forms of governmentality on project outcomes (Müller, 2017, 2022; Müller et al., 2015; Müller et al., 2017).

Forms of governmentality are recommended to understand the internal and immediate stakeholders (Clegg & Ninan, 2023), which this study aims to achieve. NG highlights the mentalities of governors who consider the collective interests of people and their consent, leading them to voluntarily abide by the contextual frameworks that shape but may or may not determine the people's behavior (Clegg et al., 2002). This approach indicates social rationality, whereby hierarchical positions do not directly govern individuals but are influenced by social reality and subtle forces within the 'formed society'.

Thus, neoliberal approaches focus more on optimizing the societal context against differences for the benefit of the governed system rather than normalizing any individual's behavior (Lemke, 2001). NG build team members' alignment with the values and ideologies of the project to nurture self-control within basic governance structures (Franck & Jungwirth, 2003). Most projects and activity-based organizations are expected to follow this philosophy (Müller et al., 2019).

2.2. Project performance

Project success has gradually changed meanings (Ika & Pinto, 2022). Barne's iron triangle, i.e., time, budget, and quality received criticism, as it does not account for customer and stakeholder satisfaction (Berssaneti & Carvalho, 2015; Creasy & Anantatmula, 2013; Williams et al., 2015). Project success was understood as hard and soft criteria (Pinto & Slevin, 2006). Objective success factors are the hard criteria (Davis, 2014), whereas human factors are soft criteria (Imam & Zaheer, 2021). Hard and soft success factors have been quantitatively proven to account for 50% of project success (Müller & Jugdev, 2012). PP is a similar construct, concerned with the behavioral reflection of the PBOs' expectations of a project (Zhu et al., 2021). Key indicators of PP, i.e., cost, quality, and progress are augmented with key determinants such as project team relationships (Gang et al., 2016), project values (Liu et al., 2019) and stakeholder satisfaction (Xiong & Li, 2018). More recent studies, particularly in construction sector, suggest customer relations, cost, quality, schedule, collaboration and communication, environmental and stakeholder satisfaction, safety and finance to be additional performance areas (Ingle & Mahesh, 2020).

Governmentality in the public sector is associated with manager's behavior and performance (Dent, 2014; Llewellyn et al., 2015; Rhodes et al., 2009); organizational learning and performance (Gherardi & Nicolini, 2002); decision-making for performance (Kroes, 2011) and individuals' social and personal lives (Miller & Rose, 2008). Governmentality is correlated to enhanced PP (Clegg et al., 2002; Müller et al., 2017). Prior studies show positive relationship between NG and project outcomes (Müller, 2022; Müller et al., 2017). So, the study hypothesizes,

H1: NG is positively associated with PP.

2.3. Neoliberal governmentality and project managers' leadership style

Governmentality and project managers' leadership styles can influence each other; however, governmentality sets the platform for leadership to perform (Dean, 2010; Turner, 2020a, 2020b). OPM discourse presents an onion model highlighting project activities in organizations where governmentality is at a higher hierarchical level than the project leadership (Müller, 2022; Müller et al., 2019; Simard et al., 2018). NG is an indirect approach (Müller et al., 2017) exercised by the formation of ideologies and values through which the members adhere to standards by self-control (Franck & Jungwirth, 2003). Governors emphasize collective interest in a given context to achieve voluntary abidance from the members (Clegg et al., 2002). Conversely, transformational managers develop a collective vision and empower their followers by encouraging them to use imagination (Barber & Warn, 2005). They modify morales, ideals and foster values

to achieve these collective goals from their followers (Pieterse et al., 2010). Recent studies show that NG is well suited with transformational leaders in comparison to transactional leaders for the effectiveness of governance at the project level (Malik et al., 2024). On the other side, transactional leaders require goal clarity from the upper management to get the task done by their followers, using contingent reward and punishment (Winkler, 2010). Hence, NG, may not provide the direct instructions (Müller et al., 2017), required by TSL. Thus, the study hypothesizes,

H2: NG is positively associated with TFL.

H3: NG is negatively associated with TSL.

2.4. Project managers' leadership style and project performance

Leadership skills are considered an important pre-requisite for project management (Kearney et al., 2024; Mohammad Al-Naghi & Alaghbari, 2024) and project manager's leadership style is crucial for PP (Clarke, 2010; Nixon et al., 2012; Odusami, Iyagba, & Omirin, 2003). Leadership effects efficiency and effectiveness of projects (Anantatmula, 2010; Potts, 2000) and a key capability of project manager for project success (Clarke, 2010; Moradi, Kähkönen, & Aaltonen, 2020; Müller & Turner, 2010). Effective leadership styles for successful projects are not investigated much by researchers (Khan, Jaafar, Javed, Mubarak, & Saudagar, 2020). Transactional and transformational leadership styles of project managers are two differentiated concepts that are well-researched in project management (Müller & Turner, 2006; Söderlund, 2011; Tyssen et al., 2014).

Transformational leaders are effective when the environment demands creativity and openness (Raziq et al., 2018), whereas transactional leaders are endorsed for engineering projects (Müller & Turner, 2007). Both project managers' transformational and transactional leadership styles positively impact PP (Jiang et al., 2021). Thus, the study hypothesizes its next set of hypotheses.

H4: TSL is positively associated with PP.

H5: TFL is positively associated with PP.

2.5. Mediating role of project managers' leadership style

Project managers look forward to the senior management to acquire organizational support (R. Ahmed et al., 2022; Riaz Ahmed et al., 2016). Therefore, the informal and interpersonal skills of the project manager become more important in maintaining a positive relationship with the senior management (Müller & Turner, 2010). NG is differentiated in its ideology as it develops a value system for self-compliance (Clegg & Ninan, 2023; Clegg et al., 2002) and OPM discourse considers NG at a higher hierarchical level than the project manager's leadership (Drouin et al., 2017; Müller et al., 2019). Thus, the project manager's style becomes central in conceiving and shaping the value system for the project members in NG, as they act as a buffer for the translation of governmentality at the project level (Malik et al., 2024).

Different project managers in terms of management have the same authority and power prescribed by the structure of the PBOs (Müller, 2022), but they may differ in how they conceive and perform their duties as explained in introduction using McGregor's theory X and Y (1960) and Rotter's social learning theory (1954). TSL and TFL also differ in how they accomplish their tasks (Bass, 1985, 1990; Bass & Avolio, 2004; Bass & Riggio, 2006). Therefore, this variance of project managers may influence the relationship of NG and PP differently. Hence, the study proposes the hypotheses:

H6: TSL mediates the relationship between NG and PP.

H7: TFL mediates the relationship between NG and PP.

2.6. Moderating role of centralization of governance structure

Governance structures have been associated with project outcomes in project management studies (Badewi, 2022; Badewi & Shehab, 2016; Joslin & Müller, 2016; Narayanan & Narasimhan, 2014). Recent studies also highlight the moderating nature of governance while studying decision-making in projects for successful performance (Turner, 2020a, 2020b). Governance structures are also observed to moderate the relationship between the governance level and project-level human agents, i.e., governmentality and project leadership (Malik et al., 2024). Furthermore, the structural arrangements are observed to strengthen the relationship between leadership and project success (Ahmed et al., 2023). Hence, following these studies, this paper investigates the moderating effect of governance structure on the relationship between NG and project leadership styles and, eventually, PP.

This study uses CEN to differentiate the centralized versus decentralized governance structures in the PBO. CEN is a key characteristic of organizational structure (Robbins & Judge, 2008). It refers to power and authority dynamics in an organization and is associated with decision-making by the top-level hierarchy (Hage & Aiken, 1969). Highly centralized structures concentrate resources at the top (Child, 1973). NG characterized by a basic structure (Franck & Jungwirth, 2003) appears to be divergent from the concept of CEN. NG is expected to have less structure and flexibility (Lemke, 2001); thus, structures are supposed to be at a lower level of CEN in PBOs with NG. So, to investigate this, the study hypothesizes,

H8: CEN moderates the relationship between NG and PP.

Prior research suggests that a higher level of CEN is expected to heighten transactional behaviors in leaders (Sarros et al., 2002). Conversely, higher levels of CEN are supposed to suppress the empowerment required by transformational leaders (Kim & Shin, 2019). Higher CEN is also found to limit the autonomy and discretion exercised by members from primary decisions and confine them to defined boundaries (Sarros et al., 2002). NG and TFL are observed to be aligned, whereas NG contrasts with TSL for effectiveness of governance at the project level (Malik et al., 2024). Hence, to investigate this, the study hypothesizes,

H9: CEN moderates the relationship between NG and TSL.

H10: CEN moderates the relationship between NG and TFL.

According to leadership contingency theory, leadership effectiveness is contingent upon the contextual elements of the organization (Fiedler, 1996; Fiedler & Chemers, 1967; Katz & Kahn, 2015; Pawar & Eastman, 1997). Therefore, to assess the impact of human and structural governance on PP through varying project leadership styles, we propose the following hypotheses:

H11: CEN moderates the relationship between NG and PP mediated by TSL.

H12: CEN moderates the relationship between NG and PP mediated by TFL.

The current study chooses NG as an antecedent variable to investigate these human and structural aspects of governance impacting PP. The conceptual model treats NG as antecedent variable due to following reasons. The hierarchical positioning of NG is higher than the project managers (Drouin et al., 2017; Müller, 2022; Müller et al., 2019). Similarly literature suggests governmentality to be a steering-level phenomenon (Müller, 2017, 2022; Müller et al., 2019; Müller, Pemsel, & Shao, 2014; Müller et al., 2014; Müller et al., 2015) and among structural and human agents, it is the latter who take decisions (Turner, 2020a, 2020b, 2023). Humans are self-reflexive and can navigate structures through deliberation (Archer, 2010). In contrast, structures lack this capacity.

Project managers' leadership style acts as a buffer for the translation of governmentality at the project level (Malik et al., 2024) and is observed to influence PP (Clarke, 2010; Müller & Turner, 2006, 2010; Nixon et al., 2012; Raziq et al., 2018). Several studies in project management literature relate project manager's leadership styles to PP (Müller & Jugdev, 2012; Müller & Turner, 2007; Müller & Turner, 2006; Nixon et al., 2012; Turner, Müller, & Dulewicz, 2009). This study perceives that project managers with both leadership styles can be present in PBOs (Jiang et al., 2021) governed under NG. Hence, TFL and TSL act as differentiation between human actors at the project level.

Prior studies have shown the moderating effects of structural aspects of governance in project management research (Badewi & Shehab, 2016; Joslin & Müller, 2016; Narayanan & Narasimhan, 2014). Hence, following these studies, this study investigates the moderating role of governance structures. We use centralized versus decentralized decision-making (Burns & Stalker, 1961; Sine et al., 2006) to understand the dynamics of structural aspects of governance vis-à-vis human aspects of governance and PP. This study tries to understand project managers' leadership variations via transformational and transactional styles (Bass, 1990). It must be noticed that both leadership styles are different ways to get the task done (Bass, 1985, 1990), and the effectiveness of any leadership style depends on the context provided (Fiedler & Chemers, 1967). In this study, the context is characterized by NG and the degree of CEN. The conceptual model of the research is presented in Figure 1.

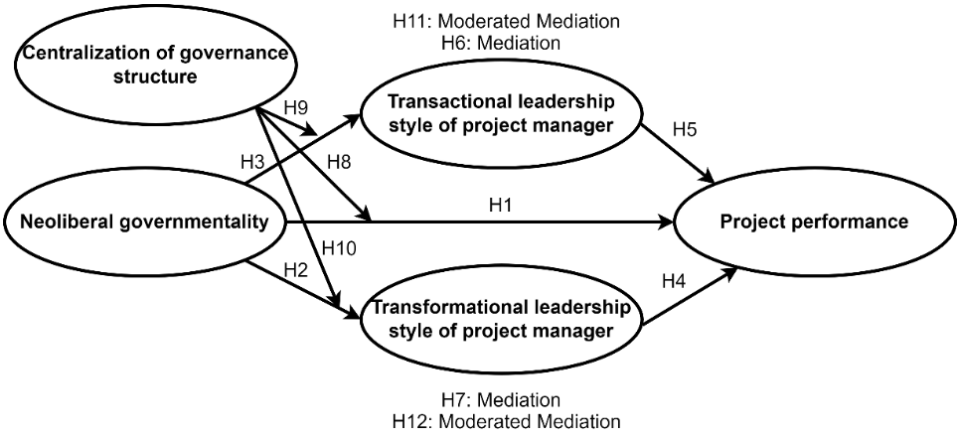

Fig. 1. Conceptual model of the study

3. Methodology

The study follows confirmatory theory to accept or reject the proposed hypotheses (Henseler et al., 2016). The conceptual model (Figure 1) was tested with PLS-SEM using Smart PLS for analysis (Hair et al., 2023; Hair et al., 2016; Hair Jr & Sarstedt, 2019). PLS-SEM is suitable for data samples that are small and skewed, requiring complex modeling such as mediation, moderation, and moderated mediation (Hair Jr & Sarstedt, 2019; Sarstedt et al., 2021; Shmueli et al., 2019). The study follows the guidance provided by Cheah and colleagues for moderating mediation testing using PLS-Process (Cheah et al., 2021). Lastly, the study uses an artificial neural network approach to check the model's robustness, accuracy, and ranking of the key variables (Liébana-Cabanillas et al., 2017).

3.1. Measurement development

This study uses five variables, i.e., NG , PP, TFL, TSL and CEN. All the variables were measured on previously used and tested measurement scales. Items for each scale are presented in Appendix A. The study adapted a five-point Likert scale (from 1-strongly disagree to 5-strongly agree) for all the variables. A three item scale was adopted for NG i.e., independent variable (Müller et al., 2017) and a six item scale for PP i.e., the dependent variable (Rodrigues et al., 2014). TSL and TFL as mediators were measured on four and five items scales respectively (Masa'deh et al., 2016). CEN as moderator was measured on three item scale (Kaufmann et al., 2019). Gender, education, sector, project experience were used as control variables (Zhu et al., 2021).

3.2. Sample and data collection

The study collected primary data by using a structured questionnaire to obtain responses from project-based organizations in Pakistan's construction industry. Construction industry suits this research, as highlighted in the introduction of this article. Convenience sampling was employed to ensure a maximum response rate for the research. Before circulation of the questionnaire, a pilot study was conducted from 36 practitioners and three Professors in project management discipline, who made constructive changes for sequence and flow of the questionnaire. The target population comprised of governors, project directors, project management offices, project managers, assistant project managers, and project team members working in construction sector PBOs. Personal contacts and their industry linkages were utilized to administer the questionnaire to right audience. Personal visits were also done to get the feedback of the respondents. A total of 250 questionnaires were circulated by visiting PBOs using industry contacts. Out of 286 responses (including pilot study responses), 218 dully filled questionnaire were sorted to be used for the final analysis. This number meets the statistical requirement i.e., 10 responses against each item (Hair et al., 2016). A summary is presented in the Table 1.

Table 1. Detailed information of respondents

Content	Category	Coding	Frequency	Percentage (%)
Gender	Male	1	133	61.0
	Female	2	85	38.9
Sector	Public	1	54	24.7
	Private	2	89	40.8
	Public-Private Partnership	3	75	34.4
Education	Undergraduate	1	24	11.1
	Graduate	2	68	31.1
	Masters	3	99	45.4
	PhD	4	27	12.3
Project Skill	Beginner	1	36	16.5
	Intermediate	2	107	49.1
	Expert	3	75	34.4
Experience in Projects (Years)	<5years	1	60	27.5
	5–10 years	2	82	37.6
	11–15years	3	67	30.7
	>15years	4	9	4.2
Employees in Organization	1–500	1	65	29.8
	501–1000	2	92	42.2

Content	Category	Coding	Frequency	Percentage (%)
Unit size of project team	1001–above	3	61	27.9
	100-250	1	60	27.5
	251–500	2	87	39.9
	501–above	3	71	32.5
Budget of project ($mm)	<5	1	63	28.8
	5–10	2	121	55.5
	10–15	3	25	11.4
	>15	4	9	4.2

Note(s): Number of respondents (N=218)

4. Data analysis and results

4.1. Common method bias

Common method bias (CMB) variance is a primary issue in self-reported data (Schwarz et al., 2017) and happens when respondents fill in data for exogenous and endogenous variables (Podsakoff et al., 2003). The study follows the guidelines of earlier studies to minimize CMB variance (Podsakoff & Organ, 1986). Firstly, the respondents were assured of the data confidentiality and anonymity. Secondly, respondents were told that there were no right or wrong answers to the question. Thirdly, respondents were asked to respond according to the last project participated as a reference.

After data collection, the study checked for any CMB concerns using two methods. First, Herman's single factor test indicated that there is no single factor that accumulated above 46.2%, which is less than the suggested cut-off value (Harman, 1976). The second method is full collinearity assessment using Smart PLS software (Shahzad et al., 2020). All the variance inflation factors (VIF) for the inner model were below the minimum threshold presented in Table 2. VIF<3.33 indicates that a study is free from CMB (Kock, 2015).

Table 2. Results of full collinearity assessment

Inner Model Paths	Collinearity Statistics (VIF)
NG → PP	2.564
NG → TFL	1.000
NG → TSL	1.000
TFL → PP	2.442
TSL → PP	1.081

4.2. Measurement validation

Measurement model assessment in PLS-SEM (Hair et al., 2023; Hair et al., 2016; Sarstedt et al., 2021) checks the reliability and validity of the constructs in the model. All the values of Cronbach's alpha (α) and composite reliability (CR) are less than 0.70 (Hair et al., 2016). Next, for convergent validity, the accepted values of average variance extracted (AVE) are greater than 0.50 (Sarstedt et al., 2021). Further, factor loadings for each item of the construct presented standard values (Cohen, 1988, 2013). Detailed information about reliability values and convergent validity of the measurement model is presented in Table 3.

Table 3. Construct reliability and validity

Constructs	OL	α	CR	AVE
NG		0.881	0.927	0.808
NG1:	0.894			
NG2:.	0.883			
NG3:	0.923			
CEN		0.914	0.946	0.853
CEN1:	0.935			
CEN2:	0.916			
CEN3:	0.920			
PP		0.923	0.940	0.723
PP1:	0.730			
PP2:	0.881			
PP3:	0.859			
PP4:	0.891			
PP5:	0.862			
PP6:	0.868			
TFL		0.927	0.945	0.773
TFL1:	0.891			
TFL2:	0.866			
TFL3:	0.898			
TFL4:	0.850			
TFL5:	0.891			
TSL		0.928	0.948	0.820
TSL1:	0.878			
TSL2:	0.914			
TSL3:	0.905			
TSL4:	0.924			

Note(s): OL= Outer loadings, α= Cronbach's Alpha; CR= Composite Reliability; AVE= Average Variance Extracted

4.3. Discriminant validity

The measurement model's discriminant validity (DV) was subsequently assessed using two methods. All the square root values of AVE were significantly higher than the correlation of all used constructs in parallel rows and columns, establishing DV as per Fornell and Larcker criterion (Fornell & Larcker, 1981). These results are depicted in Table 4. A more contemporary method for DV assessment is the Heterotrait-monotrait (HTMT) correlation ratio (Henseler et al., 2016). HTMT values were lesser than the standard cut-off value of 0.85. Hence, this method also established DV for the study depicted in Table 5.

Table 4. Discriminant validity- Fornell and Larcker criterion

	NG	CEN	PP	TFL	TSL
NG	0.899				
CEN	0.661	0.924			
PP	0.612	0.579	0.850		
TFL	0.762	0.610	0.617	0.879	
TSL	-0.233	-0.188	-0.004	-0.085	0.906

Table 5. Discriminant validity- Heterotrait-monotrait ratio (HTMT) matrix

	NG	CEN	PP	TFL	TSL
NG					
CEN	0.735				
PP	0.674	0.625			
TFL	0.840	0.660	0.657		
TSL	0.251	0.189	0.059	0.091	

4.4. Structural model assessment

The structural model is generally assessed before hypothesis testing (Hair et al., 2023; Hair et al., 2016). Predictive and explanatory power for the structural model were assessed using R^2, Q^2, f^2, and path coefficient (β) values of the variables in the study. The R^2 value of the model was observed for TFL=0.581, TSL 0.054, and PP=0.440. R^2 values of 0.26 are considered substantial, 0.13 moderate, and 0.02 weak for an endogenous latent variable (Cohen, 1988, 2013). Hence, the overall model of the study has reasonable explanatory power in terms of R^2 values.

The model's predictive power requires further recommended precautions such as assessment of Q^2 and f^2 values (Sarstedt et al., 2021). Q^2 values presented in Table 6 and f^2 values presented in Table 7 fall in the acceptable range (Cohen, 1988); thus, the model has predictive relevance.

Table 6. Predictive power from the Q-square of the endogenous latent variables

	SSO	SSE	Q^2 (=1-SSE/SSO)
PP	1308.000	898.767	0.313
TFL	1090.000	605.575	0.444
TSL	872.000	835.975	0.041

Table 7. Predictive power from f-square of the endogenous latent variables

Path	*f*
NG → PP	0.104
NG → TFL	1.388
NG → TSL	0.057
TFL → PP	0.081
TSL → PP	0.021

The study used standardized mean square residual (SRMR) for model fitness with an observed value of 0.050, which is less than 0.08 to establish model fitness (Hair et al., 2023; Hair et al., 2016; Hair Jr et al., 2019; Kline, 2005).

4.5. Hypothesis testing

The study used the recent recommendation of taking 10,000 bootstraps rather than 5,000 to analyze hypotheses (Hair et al., 2017). Results for direct effects, mediation and simple moderation are illustrated in Table 8.

Table 8. Summary of results for direct, mediating and moderating effects

Hypotheses	β	SE	T	R^2	Results
Direct Effects					
H1: NG→PP	0.386***	0.099	3.915		Supported
H2: NG→TFL	0.762***	0.042	18.023		Supported
H3: NG→TSL	-0.233**	0.071	3.274	0.440	Supported
H4: TFL→PP	0.332***	0.100	3.303		Supported
H5: TSL→PP	0.114**	0.049	2.305		Supported
Mediating Effects					
H6: NG→TSL→PP	-0.026**	0.014	1.893	0.054	Competitive Partial Mediation
H7: NG →TFL→PP	0.253***	0.076	3.327	0.581	Complementary Partial Mediation
Moderating Effects					
H8: CEN*NG→PP	-0.200**	0.063	3.189	0.504	Supported
H9: CEN*NG→TSL	-0.067	0.082	0.8822	0.060	Unsupported
H10: CEN*NG→TFL	-0.228**	0.076	3.009	0.638	Supported

Note(s): (1) ***p =< 0.001 **p < 0.05 | (2) β = Path Coefficient, SE = Standard Error, T = T-value

The analysis revealed that all the direct effects i.e., H1, H2, H3, H4 and H5 were significant. All the selected control variables in the study showed insignificant p-values for PP, e.g., gender (β= 0.118, t =1.214, p = 0.112); education (β= -0.020, t=0.481, p=0.315); sector (β= 0.031, t = 0.612, p= 0.270); employee in the organization (β= 0.001, t = 0.017, p = 0.493) unit size of project team (β= -0.029, t =0.574, p = 0.283); and experience in projects (β= 0.037, t =0.751, p = 0.226). The results of H6 and H7, i.e., mediation, were assessed and interpreted following the guideline of previous literature (Nitzl et al., 2016). TSL partially mediate the relationship between NG and PP, but in competitive manner. On the other side, TFL mediate the relationship between NG and PP in a complementary manner. The results for moderation for H8 showed that CEN dampens the relationship between NG and PP. On the contrary, H9 was not supported, as the results indicated that there is no significant impact of CEN on the relationship between NG and TSL. This study supports H10 as with increased CEN, the relationship between NG and TFL is dampened. Furthermore, slope analysis of the 'supported' hypotheses i.e., H8 and H10, are presented in Figure 2.

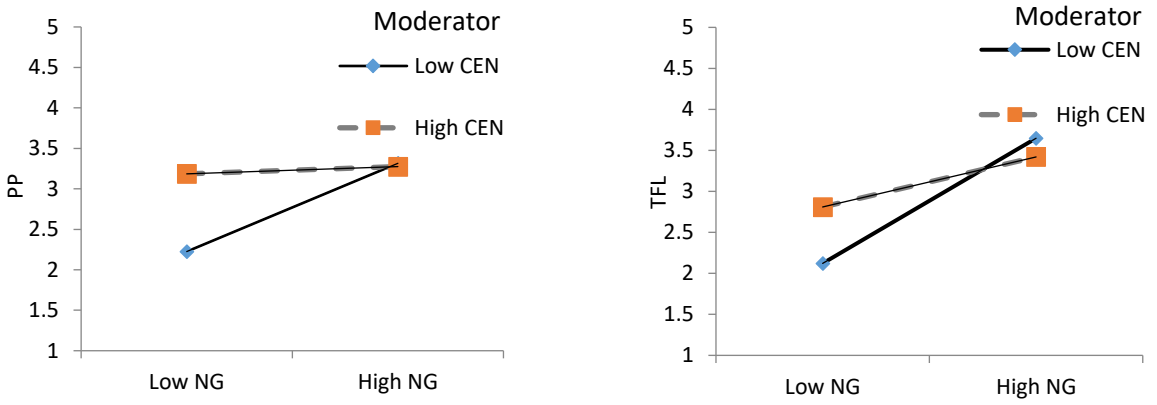

Fig. 2. Slope analysis

This study uses the SmartPLS-4 process tool to analyze and interpret moderated mediation results for hypotheses H11 and H12, following guidelines from literature (Cheah et al., 2021; Hayes, 2015, 2018). The results for moderating mediation and probing moderated indirect effects are presented in Table 9.

Table 9. Moderated mediation results

Hypotheses	β	SE	T	Result
Moderated Mediation Effects				
H11: CEN*NG →TSL →PP	-0.008 *(ω)*	0.011	0.717	Unsupported
H12: CEN*NG →TFL →PP	-0.063** *(ω)*	0.031	2.004	Supported
Probing Moderated Indirect Effects (H12)				
High Level of CEN	0.096**	0.050	1.926	
Mean Level of CEN	0.171***	0.048	3.575	
Low level of CEN	0.246***	0.070	3.514	

Note(s): *ω 1* = Index of moderated mediation for H11= *ω*=[(CEN*NG→ TSL) *(TSL→PP)]
ω 2 = Index of moderated mediation for H12= *ω*=[(CEN*NG→ TFL) *(TFL→PP)]

Interpreting Table 9, the results indicate that there is neither moderating mediation and subsequently no moderated indirect effects for H11 on the path. However, there is a significant and negative CoMe effect for H12. Therefore, probing moderated indirect effects for H12 showed that with the increase in CEN, the indirect effect of NG on PP through TSL is reduced and vice versa.

To understand the indirect effects, the study used Johnson and Neyman's Plot to explain the *CoMe* effect (Preacher et al., 2007). It can be seen in Figure 3 that mediation of the TSL between NG and PP is inversely contingent upon moderation by CEN. We present the finalized model of the study in Figure 4.

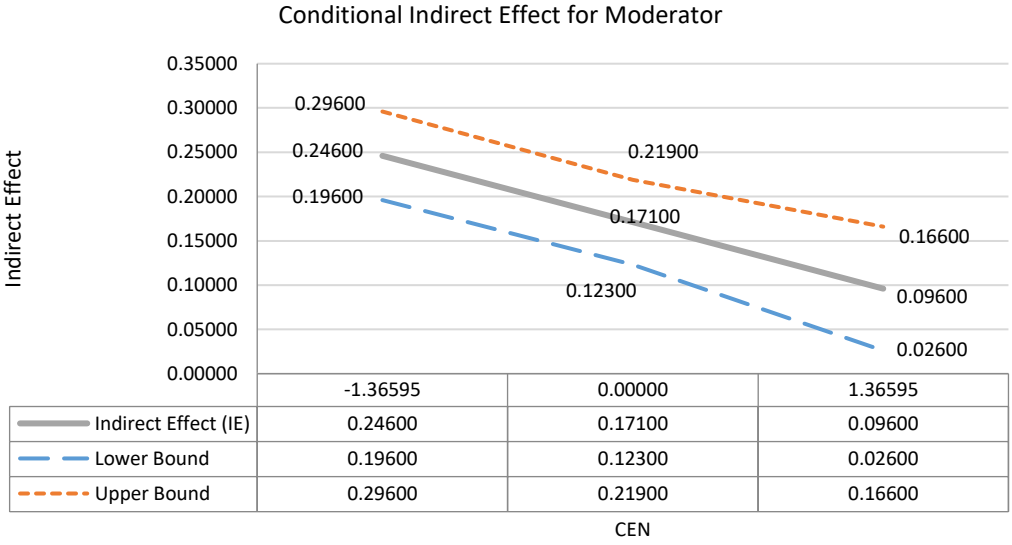

Fig. 3. Moderated mediation plot

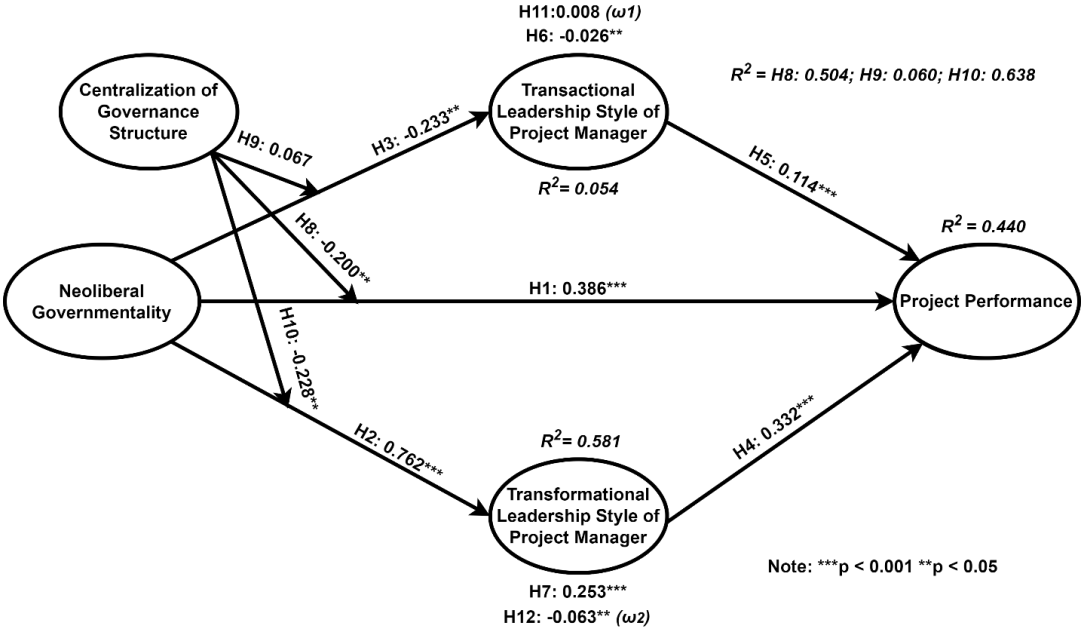

Fig. 4. Finalized model of the study

4.6. Robustness check using artificial neural network approach

This study uses a typically used and well-known artificial intelligence type, the multi-layer perceptron (MLP), to train the neural networks. This study models the neural network, consisting of several hierarchical layers, in SPSS 26.0., following the steps presented in literature (Latif et al., 2024; Liébana-Cabanillas et al., 2017; Shahzad et al., 2022). The Average Root Mean Square Error (RMSE) for PP was 0.460 for training data and 0.456 for testing data, showing a slight difference which confirms that the model generalizes well to the unseen data. The standard deviation assessment for all the RMSE values of the training and testing data set were 0.026 and 0.068, respectively. Therefore, the study considers the model to have acceptable predictive power. These results are shown in Table 10.

Table 10. Neural network validation

	Training data			Testing data		
Neural network	*N*	Sum of square error	RMSE	*N*	Sum of square error	RMSE
1	153	37.027	0.492	65	8.478	0.361
2	162	29.374	0.426	56	12.655	0.475
3	150	31.169	0.456	68	13.981	0.453
4	149	30.186	0.450	69	16.756	0.493
5	157	30.628	0.442	61	14.325	0.485
6	157	29.421	0.433	61	18.648	0.553
7	142	34.481	0.493	76	7.717	0.319
8	146	35.996	0.497	72	17.187	0.489
9	157	31.620	0.449	61	13.662	0.473
10	156	35.900	0.480	62	14.688	0.487
Average			0.460			0.456
SD			0.026			0.068

Note(s): Average Root Mean Square Error (RMSE), *N* refers to the total number of samples, SD refers to the standard deviation

Subsequently, the study performs a sensitivity analysis to assess the influence and ranking of the covariates. The values in Table 11 imply that CEN is the most important predictor of PP after the transformational project manager, with a value of 98.38, followed by NG (68.13). TSL remains the least important predictor for PP in this research, with a value of 51.63. Sensitivity analysis results demonstrate that optimization of the predictor with the highest value results in better outcomes in the observed dataset and improves the model efficiency.

Table 11. Sensitivity analysis

Neural networks	NG	CEN	TFL	TSL
1	0.134	0.231	0.540	0.095
2	0.134	0.309	0.370	0.184
3	0.165	0.422	0.362	0.051
4	0.150	0.368	0.324	0.159
5	0.417	0.174	0.258	0.151
6	0.262	0.290	0.232	0.216
7	0.132	0.422	0.260	0.187
8	0.286	0.253	0.224	0.237
9	0.179	0.259	0.404	0.158
10	0.281	0.364	0.170	0.185
Average Importance	0.214	0.309	0.314	0.162
Relative Importance	0.681	0.984	1	0.516
Normalized Importance	68.13	98.38	100	51.63

5. Discussion and conclusion

5.1. Discussion

The study presents a novel conceptual model to understand the intra-organizational dynamics of humans and the structure for PP in NG using SPG. The study is grounded in, but not restricted to the OPM discourse, that relates all the project activities in hierarchical levels. This model is instrumental in understanding the impact of NG on PP, with varying leadership styles of project managers serving as mediators. NG, governance structures and project managers' leadership styles have been seen as precursors of project outcomes by several studies, but in isolation. However, this study shows the association among these variables to envision their mutual influence on project performance. The study also stresses the role of governance structures as a moderating variable and establishes a link between the human aspects at the governance (NG) and the execution level (a specific project managers' leadership style).

Research shows that NG can impact project performance, however, project managers' leadership that buffers it at the project level is neglected. There is overwhelming evidence that shows effective communication and networking are highly valued in comparison to task-oriented project managers for successful construction projects (Ashok et al., 2024). However, the association of varying styles of leaders in a certain governmentality-governance context remained absent in the literature. The present study acknowledges that there can be different project managers' leadership styles in construction sector (Jiang et al., 2021) and identifies them as mediators for the impact of NG on PP. Furthermore, the study uses ARST (Archer, 2010) to relate the governance structure's moderating effect on human interactions of NG and project managers' leadership styles for PP. We respond to the research questions below to discuss the results of this study further.

RQ1: Do varying project managers' leadership styles influence the relationship between NG and PP? Results revealed that project managers' leadership style do provide mediation between NG and PP. However, the effects of mediation may vary, as different leadership styles of project managers mediate the relationship between NG and PP in distinct ways. Transformational leaders as project managers positively mediate the relationship between NG and PP. These leaders

desire an institutional environment that empowers them and lets them flourish when the neoliberal style of governors is in place (Barber & Warn, 2005; Bass, 1985, 1990; Bass & Riggio, 2006; Pieterse et al., 2010). This study confirms that human dimensions of NG at governance level and TFL at the project level synchronize (Malik et al., 2024) for PP. Despite TSL positive impact on PP, it was considerably lesser compared to TFL impact on PP. Furthermore, TSL showed a competitive mediation between neoliberal governors and PP. A plausible reason for the negative relationship between NG and TSL could be the absence of clear directions from governors in NG. Prior research also explains this characteristic of transactional leaders who are prone to taking clear directions from the top managers to accomplish their tasks using rewards and punishments (Bass, 1985, 1990; Winkler, 2010). Our results are aligned with prior research in construction sector that supports transformational behaviors of project managers for better project outcomes (Ashok et al., 2024).

RQ2: Do varying CEN influence the relationship between NG and differentiated project leadership styles for PP? Results showed interesting insights regarding the moderation effect of CENs on the human aspects of governance at the steering and project level for PP. Results showed that CEN dampened the relationship of NG with PP. This result was expected because of the contrasting characteristics of CEN and NG. CEN means accumulation of power, information, decisions, and resources at the top management hierarchy (Child, 1973; Hage & Aiken, 1969), whereas NG is characterized to have flexible structures (Franck & Jungwirth, 2003) decentralized decision making in comparison to authoritative governmentality (Dean, 2010). Therefore, our research extends the existing knowledge about the structural aspects of governance and highlighted their moderating effect on human aspects for influencing PP. Results of the study indicated that CEN dampened the relationship between NG and TFL. Prior studies have also shown that the CEN of the structure halts the effectiveness of transformational leaders (Kim & Shin, 2019; Sarros et al., 2002; Walter & Bruch, 2010). Furthermore, the results indicated that there was no moderation effect of CEN between the relationship of NG and TSL. Prior studies also indicate that TSL are less likely to be observed in context of NG due to contrasts between the two styles. The same insignificant effect was reciprocated in the indirect effects of moderation on the TSL' mediated relationship of NG and performance. However, TFL as mediators are moderated by lower levels of CEN to enhance the association of NG with PP. This finding aligns with the traditional viewpoint that leadership effectiveness depends on contextual factors within organizational boundaries (F. E. Fiedler & Chemers, 1967).

RQ: Do varying project managers' leadership styles and CEN in PBOs influence the relationship of NG impacting PP? The study answers the main research question by replying to the above initial questions. The relationship between NG and PP is associated through the mediation of TFL, and lower levels of CEN can improve the overall relationship. However, this relationship has competitive partial mediation through TSL, and there is insignificant moderation of CEN in this relationship. Furthermore, the model is validated using a neural network approach. The ranking of variables shows that transformational leadership is mostly associated with PP. CEN is the second most important variable in this model to predict the outcome; it moderates the relationship between two human aspects of NG and project managers' leadership styles. Lastly, TSL are the least important among the studied variables in the model to predict PP. Furthermore, based on the results, the study recommends the TFL suitability for NG's impact on PP. Conversely, TSL in such governance arrangement are undesirable and may prove detrimental to PP. Therefore, the study concludes that one man's meat is another man's poison.

5.2. Theoretical contributions

This study has several theoretical contributions. Firstly, the study extends the SPG (Müller, 2022; Müller et al., 2023) by presenting a conceptual model to understand the human vs structure interactions for PP. The presented model elucidates the variations of the variables at the project level and helps to understand their mutual effect on PP in NG. Secondly, the model illuminates the mediating effect of varying project managers' leadership style on the relationship between NG and PP. The crucial role of project managers in project governance is known (Müller et al., 2019), nonetheless, the variations of their styles in context of NG is novel. Thirdly, the model explains the moderating nature of governance structures by using CEN as a moderator between human aspects at different levels and PP. Prior studies explain the moderating role of

governance structures (Müller & Martinsuo, 2015; Müller et al., 2016). Furthermore, the study acknowledges and adds to the theorization of humans' self-reflexivity compared to the structure (Archer, 2010) by using NG as an antecedent variable and CEN as moderator.

Lastly, previous studies have linked NG (Clegg & Ninan, 2023; Müller et al., 2017; Ninan et al., 2019), governance structures (Badewi & Shehab, 2016; Joslin & Müller, 2016; Narayanan & Narasimhan, 2014) and project managers' leadership styles (Müller & Turner, 2010; Nixon et al., 2012; Raziq et al., 2018) with PP in isolation, however this study checks the combined effect of these variables on PP. This model, thus, contributes to OPM discourse (Drouin et al., 2017; Müller et al., 2019).

5.3. Managerial implications

The study's findings have several practical implications for project owners, governors, and practitioners in construction sector. Project managers' leadership style is interwoven with the governance of a PBO for achieving PP. Hence, hiring project managers must include assessing interpersonal skills apart from their technical expertise. In other words, owners and governors need to understand the importance of behavioral aspects of project managers that could facilitate or hamper the project outcomes. This exercise can save them from unexpected results in terms of PP. Furthermore, appointed project managers must be provided training and communication opportunities to better understand their roles and act in abidance with the NG.

Conversely, neoliberal governors must consider the importance of alignment of structures in place. CEN clamps authority, decision making, and resources at the top. In such a case, the projects may suffer from conflicts, due to sabotaged project managers autonomy for minor decisions. Governors can make required adjustments in the structures to meet the project requirements. The foremost aim of the neoliberal governors is to align their structures with their own style and select appropriate project managers. This can create synergies among the humans and structures, eventually increasing the probability of successful projects.

5.4. Limitations and further research

This study has a few limitations. Firstly, other levels lie in between governors and project managers, for example, portfolio managers (Derakhshan et al., 2019). However, the study followed existing conceptualization that mutually positions governors and project managers in a single frame (Müller, 2022). Also, the neoliberal governors have collective visions that are expected to translate to portfolio managers in a similar fashion to the project managers. Prior studies have also used these two levels to research governance interface (Müller et al., 2016; Pisotska et al., 2022; Winch et al., 2022). Secondly, CEN was the only dimension used for assessing the moderation of governance structures, whereas there are many other dimensions of organizational structures (Burns & Stalker, 1961; Sine et al., 2006). However, researchers have shown that all the constructs of structure might not explain a specific structure, and CEN is a key factor in distinguishing organizational structure (Hage & Aiken, 1969; Robbins & Judge, 2008). Lastly, the dataset was collected from the construction industry in Pakistani PBOs. Therefore, the study restricts the generalizability of results, hence, grounded in critical realism stance (Bhaskar, 2010).

The area of the studied research is critical in order to understand the intricacies of human and structures during their interactions at the project level for PP. Governance and management are entangled concepts in terms of project outcomes. Therefore, assessing disparities in the governmentality, project managers' leadership styles and structures can provide recipes for higher performance and lower performance. Future research can provide different recipes and solutions for achieving high performance due to variations of studied variables or vice versa. Other studies could also replicate the model for other forms of governmentality (authoritative and liberal) to understand the context-specific implications. Subsequent studies may validate these findings in other sectors to explore potential sector-specific dynamics among human and structural aspects of governance for enhanced PP.

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Appendix A. Questionnaire

First section of the questionnaire focused on demographic information. Gender, sector, education, project skill, project experience, employees in organization, unit size of the project and budget of the project were used as control variables following Zhu et al., (2021). Ranges for each asked question are mentioned in detailed information of the respondents in Table 1.

Second section adapted measurement items from existing studies on a five-point Likert scale (from 1-strongly disagree to 5-strongly agree). The items of each variable and relevant reference is provided below.

No.	Code	Item description	Variable and reference
1.	NG1	In my project, the project governance institution communicates values and fosters a culture that allows the project manager/team to control themselves	Neoliberal governmentality (NG) (Müller et al., 2017)
2.	NG2	In my project, the project governance institution expects the project manager and team to decide for themselves based on the collective interest of the stakeholders in the project.	
3.	NG3	In my project, the project governance institution rarely steers the project through directive orders.	
4.	CEN1	I must check with my supervisor before I do almost anything	Centralization (CEN) (Kaufmann et al., 2019)
5.	CEN2	Even small matters have to be referred to someone higher up for a final answer	
6.	CEN3	In general, an employee wanting to make their own decisions in my workplace would be quickly discouraged	
7.	PP1	Compared to the original plan, the project has achieved its progress targets well	Project Performance (PP) (Rodrigues et al., 2014)
8.	PP2	Compared to the original plan, the project has achieved its cost targets well	
9.	PP3	This project has effectively met the technical specifications required by the original plan	
10.	PP4	The project has met the quality standards originally planned	
11.	PP5	The project has been recognized and approved by customers	
12.	PP6	The project has given the company good income and market share	
13.	TFL1	My project manager encourages me to take on challenges	Transformational and transactional teadership style (TFL and TSL) (Masa'deh et al., 2016)
14.	TFL2	My project manager encourages me to think about problems from a new perspective	
15.	TFL3	My project manager displays a sense of power and confidence	
16.	TFL4	My manager helps me to strengthen my abilities	
17.	TFL5	My manager spends time coaching and teaching me	
18.	TSL1	When I am unable to complete my work, my manager reprimands me	
19.	TSL2	My manager precisely records any of my mistakes	
20.	TSL3	My manager gives me what I want to exchange for my hard work	
21.	TSL4	My manager tells me that I can get special rewards when I show good work performance	

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